

CLAIMS

What is claimed is:

1 1. A method of compensating for tilt of an optical recording medium, the method
2 comprising:
3 detecting the tilt of the optical recording medium; and
4 compensating a recording signal having a predetermined recording pattern with respect
5 to the detected tilt using a predetermined scheme.

1 2. The method of claim 1, wherein the predetermined scheme comprises adjusting
2 a power level required for recording the recording signal.

1 3. The method of claim 1, wherein the predetermined scheme comprises adjusting
2 a time required for recording the recording signal.

1 4. The method of claim 1, wherein said compensating the recording signal
2 comprises:
3 shifting the recording pattern with respect to the detected tilt; and
4 adjusting a power and/or a time required for recording with respect to the detected tilt
5 wherein the size of a recording mark corresponding to the recording signal is compensated.

1 5. The method of claim 4, wherein
2 the adjusting the power comprises adjusting a write power to compensate a length of the
3 recording mark, and
4 the adjusting the time comprises adjusting a write time to compensate a width of the
5 recording mark.

1 6. The method of claim 5, wherein the write time adjusting comprises adjusting an
2 ending time of a first pulse and/or a starting time of a last pulse of the recording pattern.

1 7. The method of claim 4, wherein the adjusting the power comprises
2 adjusting a write power to compensate a length of the recording mark, and
3 adjusting a write power of a multi-pulse chain of the recording pattern to adjust
4 a width of the recording mark.

1 8. A method for compensating input data for tilt of an optical recording medium,
2 which records marks and spaces by write pulses having a predetermined recording pattern, the
3 method comprising:

4 detecting the tilt of the optical recording medium; and
5 adaptively compensating the recording pattern with respect to the detected tilt using a
6 memory storing data comprising

7 a power and/or a time required for recording to compensate for an amount of
8 shift of the recording pattern, and

9 a power and/or a time required for recording to compensate for a length and a
10 width of recording mark with respect to a detected tilt and/or a length of a recording mark.

1 9. A method for compensating for defocus of an optical recording medium, the
2 method comprising:

3 detecting the defocus of the optical recording medium; and

4 compensating a recording signal with respect to the detected defocus using a
5 predetermined scheme.

1 10. The method of claim 9, wherein the predetermined scheme comprises adjusting
2 a power level required for recording the recording signal.

11. A method of compensating for a tilt and a defocus of an optical recording medium, the method comprising:
detecting the defocus of the optical recording medium;
compensating a write pulse with respect to the detected defocus using a predetermined scheme, wherein the write pulse comprises a predetermined recording pattern;
detecting the tilt of the optical recording medium; and
compensating the write pulse with respect to the detected tilt.

12. The method of claim 11, wherein the predetermined scheme comprises adjusting a power level with respect to the detected defocus.

13. The method of claim 11, wherein compensating the write pulse with respect to the detected tilt further comprises:
shifting the recording pattern with respect to the detected tilt by both an amount that the recording pattern was shifted due to the detected tilt, and in a direction opposite to the direction that the recording pattern was shifted due to the detected tilt; and
adjusting a power and/or a time required for recording with respect to the detected tilt in order to compensate for a size of a recording mark corresponding to the recording signal.

14. The method of claim 13, wherein
the adjusting the power comprises adjusting a write power to compensate a length of the recording mark, and
the adjusting the time comprises adjusting a write time to compensate a width of the recording mark.

1 15. The method of claim 14, wherein adjusting the recording mark width comprises
2 adjusting an ending time of a first pulse and/or a starting time of a last pulse of the recording
3 pattern.

1 16. The method of claim 13, wherein the adjusting the power comprises
2 adjusting a write power to compensate a length of the recording mark, and
3 adjusting a write power of a multi-pulse chain of the recording pattern to adjust
4 a width of the recording mark.

1 17. A method for compensating input data for a tilt and/or a defocus of an optical
2 recording medium, which records marks and spaces by write pulses having a predetermined
3 recording pattern, the method comprising:

4 detecting the tilt and/or the defocus of the optical recording medium; and
5 adaptively compensating the recording pattern with respect to the detected tilt and/or
6 defocus using a memory, wherein the memory storing data comprising
7 a write power to compensate with respect to the detected defocus,
8 a power and/or a time required for recording to compensate for an amount of
9 shift of the recording pattern, and
10 a power and/or a time required for recording to compensate for a length and a
11 width of recording mark with respect to a detected tilt and/or a length of a recording mark.

1 18. An apparatus which records and/or reproduces information on an optical
2 recording medium and which compensates for a tilt, the apparatus comprising:
3 a tilt detector which detects the tilt of the optical recording medium; and
4 a recording compensator which compensates a recording signal with respect to the
5 detected tilt using a predetermined scheme, wherein the recording signal comprises a
6 predetermined recording pattern.

1 19. The apparatus of claim 18, wherein, according to the predetermined scheme,
2 said recording compensator adjusts a power level required for recording the recording signal.

1 20. The apparatus of claim 18, wherein, according to the predetermined scheme,
2 said recording compensator adjusts a time required for recording the recording signal.

1 21. The apparatus of claim 18, wherein said recording compensator shifts the
2 recording pattern with respect to the detected tilt, and compensates for a length and a width of
3 the recording mark with a power and/or a time required for recording.

1 22. The apparatus of claim 21, wherein said recording compensator adjusts the
2 power to compensate the length of the recording mark, and adjusts the time required for
3 recording to compensate the width of the recording mark.

1 23. The apparatus of claim 21, wherein said recording compensator adjusts the
2 power for recording to compensate the length of the recording mark, and adjusts an ending
3 time of a first pulse and/or a starting pulse of a last pulse to compensate the width of the
4 recording mark.

1 24. The apparatus of claim 21, wherein said recording compensator adjusts the
2 power required for recording to compensate the length of the recording mark, and adjusts a
3 power of a multi-pulse chain of the recording pattern to compensate the width of the recording
4 mark.

1 25. The apparatus claim 18, further comprising a luminance source which provides
2 the recording signal, wherein the wavelength of said luminance source is equal to or less than
3 approximately 430 nm.

1 26. The apparatus claim 18, further comprising an objective lens having a numerical
2 aperture greater than or equal to 0.6, and wherein the optical recording medium further
3 comprises a substrate having a thickness greater than or equal to 0.3 mm,.

1 27. The apparatus of claim 18, further comprising an objective lens having a
2 numerical aperture greater than or equal to 0.7, and wherein the optical recording medium
3 further comprises a substrate having a thickness less than or equal to 0.3 mm.

1 28. An apparatus, which records marks and spaces by write pulses having a
2 predetermined recording pattern, and which compensates for input data for tilt of an optical
3 recording medium, the apparatus comprising:

4 a tilt detector which detects the tilt of the optical recording medium; and

5 a recording compensator which adaptively compensates the recording pattern with
6 respect to the detected tilt, and further comprising a memory which stores data comprising

7 a power and/or a time required for recording to compensate an amount of shift
8 of the recording pattern, and

9 a power and/or a time required to compensate a length and a width of a
10 recording mark with respect to the tilt and/or the length of the recording mark.

1 29. An apparatus which records and/or reproduces information on an optical
2 recording medium, and which compensates for tilt and/or defocus, the apparatus comprising:

3 a tilt and/or defocus detector which detects the tilt and/or the defocus of the optical
4 recording medium; and

5 a recording compensator which compensates a recording pulse with respect to the
6 detected tilt and/or defocus using a predetermined scheme;
7 wherein the recording pulse comprises a predetermined recording pattern.

1 30. The apparatus of claim 29, wherein, according to the predetermined scheme,
2 said recording compensator adjusts a power level required for recording the recording pulse
3 with respect to the detected defocus.

1 31. The apparatus of claim 29, wherein, according to the predetermined scheme,
2 said recording compensator adjusts a power and/or a time required for recording the recording
3 pulse with respect to the detected tilt.

1 32. The apparatus of claim 29, wherein said recording compensator adjusts a write
2 power with respect to the detected defocus, and generates the recording pulse earlier to
3 compensate for an amount of shift with respect to the detected tilt, and adjusts a power and/or
4 a time of the shifted recording pulse to compensate a length and a width of a recording mark.

1 33. The apparatus for compensating of claim 32, wherein said recording
2 compensator adjusts the power required for recording to compensate the length of the
3 recording mark, and adjusts the time required for recording in order to compensate the width
4 of the recording mark.

1 34. The apparatus of claim 33, wherein said recording compensator adjusts the
2 power by adjusting a write power to compensate the length of the recording mark, and adjusts
3 the time by adjusting an ending time of a first pulse and/or a starting time of a last pulse to
4 compensate the width of the recording mark.

1 35. The apparatus of claim 32, wherein said recording compensator both adjusts the
2 power by adjusting a write power to compensate the length of the recording mark, and adjusts
3 a power of a multi-pulse chain of recording pattern to compensate the width of the recording
4 mark.

1 36. The apparatus of claim 29, further comprising a luminance source which
2 provides the recording pulse, wherein a wavelength of the luminance source is equal to or less
3 than approximately 430 nm.

1 37. The apparatus of claim 29, further comprising an objective lens having a
2 numerical aperture greater than or equal to 0.6, and wherein the optical recording medium
3 further comprises a substrate having a thickness greater than or equal to 0.3 mm.

1 38. The apparatus of claim 29, further comprising an objective lens having a
2 numerical aperture greater than or equal to 0.7, and wherein the optical recording medium
3 further comprises a substrate having a thickness less than or equal to 0.3 mm.

1 39. An apparatus, which records marks and spaces by write pulses having a
2 predetermined recording pattern, and which compensates input data for tilt and/or defocus of
3 an optical recording medium, the apparatus comprising:

4 a tilt and/or defocus detector which detects the tilt and/or defocus of the optical
5 recording medium; and

6 a tilt and/or defocus compensator which adaptively compensates the recording pattern
7 with respect to the detected tilt and/or defocus, further comprising a memory storing data
8 comprising

9 a write power to compensate with respect to the detected defocus,

10 a power and/or time required for recording in order to compensate an amount of
11 shift of the recording pattern, and
12 a power and/or time required to compensate a length and a width of a recording
13 mark with respect to the detected tilt and/or length of the recording mark.

1 40. The apparatus of claim 39, wherein the data stored in the memory comprises
2 a power and/or time and an amount of shift required for recording to
3 compensate when defocus and tilt occur together, and
4 a power and/or time and an amount of shift required for recording to
5 compensate when defocus or tilt occurs.

1 41. A method of compensating for tilt of an optical recording medium, the method
2 comprising:
3 detecting the tilt of the optical recording medium; and
4 compensating a recording signal with respect to the detected tilt using a predetermined
5 scheme.

1 42. A computer readable medium storing a computer program having instructions
2 which, when executed by a processor, cause the processor to perform a method, the method
3 comprising:
4 detecting a tilt of an optical recording medium;
5 and adaptively compensating a recording signal with respect to the detected tilt using a
6 predetermined scheme stored in a memory.

1 43. The computer readable medium of claim 42, wherein the predetermined scheme
2 comprises adjusting a power level required for recording the recording signal.

1 44. The computer readable medium of claim 42, wherein the predetermined scheme
2 comprises adjusting a time required for recording the recording signal.

1 45. The computer readable medium of claim 42, wherein said compensating the
2 recording signal comprises:
3 shifting a recording pattern within the recording signal with respect to the detected tilt;
4 and
5 adjusting a power and/or a time required for recording with respect to the detected tilt
6 wherein the size of a recording mark corresponding to the recording signal is compensated.

1 46. The computer readable medium of claim 45, wherein
2 the adjusting the power comprises adjusting a write power to compensate a length of the
3 recording mark, and
4 the adjusting the time comprises adjusting a write time to compensate a width of the
5 recording mark.

1 47. The computer readable medium of claim 45, wherein the write time adjusting
2 comprises adjusting an ending time of a first pulse and/or a starting time of a last pulse of the
3 recording pattern.

1 48. The computer readable medium of claim 44, wherein the adjusting the power
2 comprises
3 adjusting a write power to compensate a length of the recording mark, and
4 adjusting a write power of a multi-pulse chain of the recording pattern to adjust
5 a width of the recording mark.

1 49. A computer readable medium storing a computer program having instructions
2 which, when executed by a processor, cause the processor to perform a method, the method
3 comprising:
4 detecting a defocus of an optical recording medium; and
5 adaptively compensating a recording signal with respect to the detected defocus using a
6 predetermined scheme stored in a memory.

1 50. The computer readable medium of claim 49, wherein the predetermined scheme
2 comprises adjusting a power level required for recording the recording signal.

1 51. A computer readable medium storing a computer program having instructions
2 which, when executed by a processor, cause the processor to perform a method, the method
3 comprising:
4 detecting a defocus of an optical recording medium;
5 adaptively compensating a write pulse with respect to the detected defocus using a
6 predetermined scheme stored in a memory;
7 detecting a tilt of the optical recording medium; and
8 adaptively compensating the write pulse with respect to the detected tilt using the
9 predetermined scheme.

1 52. The computer readable medium of claim 51, wherein the predetermined scheme
2 comprises adjusting a power level with respect to the detected defocus.

1 53. The computer readable medium of claim 51, wherein compensating the write
2 pulse with respect to the detected tilt further comprises:

3 shifting a recording pattern within the write pulse with respect to the detected tilt by
4 both an amount that the recording pattern was shifted due to the detected tilt, and in a direction
5 opposite to the direction that the recording pattern was shifted due to the detected tilt; and
6 adjusting a power and/or a time required for recording with respect to the detected tilt
7 in order to compensate for a size of a recording mark corresponding to the recording signal.

1 54. The computer readable medium of claim 53, wherein
2 the adjusting the power comprises adjusting a write power to compensate a length of the
3 recording mark, and
4 the adjusting the time comprises adjusting a write time to compensate a width of the
5 recording mark.

6 55. The computer readable medium of claim 54, wherein adjusting the recording
7 mark width comprises adjusting an ending time of a first pulse or a starting time of a last pulse
of the recording pattern.

1 56. The computer readable medium of claim 53, wherein the adjusting the power
2 comprises
3 adjusting a write power to compensate a length of the recording mark, and
4 adjusting a write power of a multi-pulse chain of the recording pattern to adjust
5 a width of the recording mark.

1 57. A method of compensating for defocus and/or tilt of an optical recording
2 medium, the, method comprising:
3 detecting a defocus of an optical recording medium;
4 compensating a write pulse with respect to the detected defocus using a predetermined
5 scheme;

6 detecting a tilt of the optical recording medium; and
7 compensating the write pulse with respect to the detected tilt.

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